

REMARKS

Claims 10-16 are presented for consideration, with Claims 10, 15 and 16 being independent. The independent claims were previously amended to further clarify features of Applicants' invention.

Claims 10 and 13-16 stand rejected under 35 U.S.C. §103 as allegedly being obvious over Williamson et al. (U.S. Patent Application Publication No. 2004/0104935) in view of newly-cited Latham (U.S. Patent No. 5,803,738). In addition, Claims 11 and 12 are rejected as allegedly being obvious over those citations and further in view of the Lescinsky publication ("Interactive Scene Manipulation in the Virtue3D System"). These rejections are respectfully traversed.

Claim 10 of Applicants' invention relates to an image processing apparatus for compositing an image of a virtual object and an image of a physical space to generate a mixed reality image and causing an HMD to display the mixed reality image. The apparatus includes a database which holds data used for generating the image of the virtual object, an image capturing unit which is attached to the HMD and captures the image of the physical space, a first measurement unit which measures a position and orientation of the HMD, and an object manipulation unit which is used by a user wearing the HMD in order to operate a position and orientation of the virtual object. In addition, a second measurement unit measures a position and orientation of the object manipulation unit, an operation panel which can be operated by the user, arranged at a position in the physical space within a viewing field of said image capturing unit attached to the HMD, displays an operation panel image used for editing the virtual object, and is

capable of receiving a user instruction of editing the virtual object input by the user, and an operation panel image generation unit generates the operation panel image by using the data held in the database and outputs the generated operation panel image to the operation panel. A rendering unit updates the data held in the database according to the user instruction received via the operation panel and the measurement result of the second measurement unit, and renders, by using the updated data, the image of the virtual object according to the measurement results of the first and second measuring units, and a composition unit composites the image of the rendered virtual object and the captured image of the physical space to generate the mixed reality image. Finally, a HMD displays the mixed reality image generated by the composition unit.

Since an operation panel image includes a large amount of information, a large display is required to display the operation panel image. Thus, it is difficult for a relatively small display screen of an HMD to display an operation panel image. The operation panel of the present invention is arranged at a position in the physical space within a viewing field of the image capturing unit, so that the HMD user can see the operation panel image with fine visibility.

The Williamson et al. publication is relied on to teach, *inter alia*, a first measurement unit which measures a position and orientation of a HMD. As recognized on pages 3 and 4 of the Office Action, however, the Williamson et al. publication does not teach or suggest, *inter alia*, an operation panel which is positioned in the physical space displays an operation panel image used for editing the virtual image.

As such, the Office Action relies on Latham to overcome these deficiencies. Latham teaches a system for simulating the forces associated with touching objects in a virtual reality

simulator system. In contrast to Applicants' claimed invention, however, Latham does not teach or suggest, among other features, an operation panel which can be operated by the user, arranged at a position in the physical space within a viewing field of said image capturing unit attached to the HMD, displays an operation panel image used for editing the virtual object, and is capable of receiving a user instruction of editing the virtual object input by the user, as recited in Claim 10. The Examiner, on page 4 of the Office Action, cites panel 12 of Fig. 1 and column 3, lines 21-37, of the Latham patent. Panel 12, however, is not disclosed to include a display. Rather, as shown in Fig. 3, the panel includes an assortment of switches. *See*, for example, column 3, line 45, through column 4, line 16. Further, the panel 12 does not display an operation panel image. Rather, an image 10 is presented to the user wearing the head mounted display 20, and the panel 12 is used to provide the feel of cockpit control that are presented in the image. *See*, for example, column 3, lines 11-27. Accordingly, Latham fails to teach or suggest a technique for providing a mixed reality image to a user via a HMD.

On the other hand, the operation panel the present invention, as defined in claim 10, is positioned at a position, in the physical space, which can be within a viewing field of the image capturing unit attached to the HMD. Since the user wears the HMD displaying the mixed reality image, the user can see the operation panel appearing in the mixed reality image via the HMD. Accordingly, the operation panel is not to be seen directly by the user, but appears in a physical space image included in the mixed reality image to be seen via the HMD by the user.

Accordingly, without conceding the propriety of combining Williamson et al. and Latham, such a combination still fails to teach or suggest Applicants' claimed invention. The

tertiary citation to the Lescinsky publication relates to interactive scene manipulation and was relied on for teaching the generation of a image of a virtual object based on 3D CAD data. The Lescinsky publication fails, however, to compensate for the deficiencies in Williamson et al. and Latham as discussed above.

Claims 14 and 15 relate to an image processing method and a computer readable storage medium, respectively, and correspond to Claim 10. These claims are thus also submitted to be patentable over the art discussed above.

For the foregoing reasons, Applicant respectfully submits that each of independent claims 10, 15 and 16 is patentable over the applied art of record. In addition, dependent Claims 11-14 set forth additional features of Applicants' invention. Independent consideration of the dependent claims is respectfully requested. Therefore, reconsideration and withdrawal of the rejection of Claims 10 and 13-16 under 35 U.S.C. §103 is respectfully requested.

Applicant respectfully submits that all outstanding matters in the above application have been addressed and that this application is in condition for allowance. Favorable reconsideration and early passage to issue of the above application is respectfully sought.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

/Lawrence A. Stahl/

Lawrence A. Stahl
Attorney for Applicants
Registration No. 30,110

FITZPATRICK, CELLA, HARPER & SCINTO
1290 Avenue of the Americas, 17th Floor
New York, NY 10112-3800
Facsimile: (212) 218-2200
LASUDSllag

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